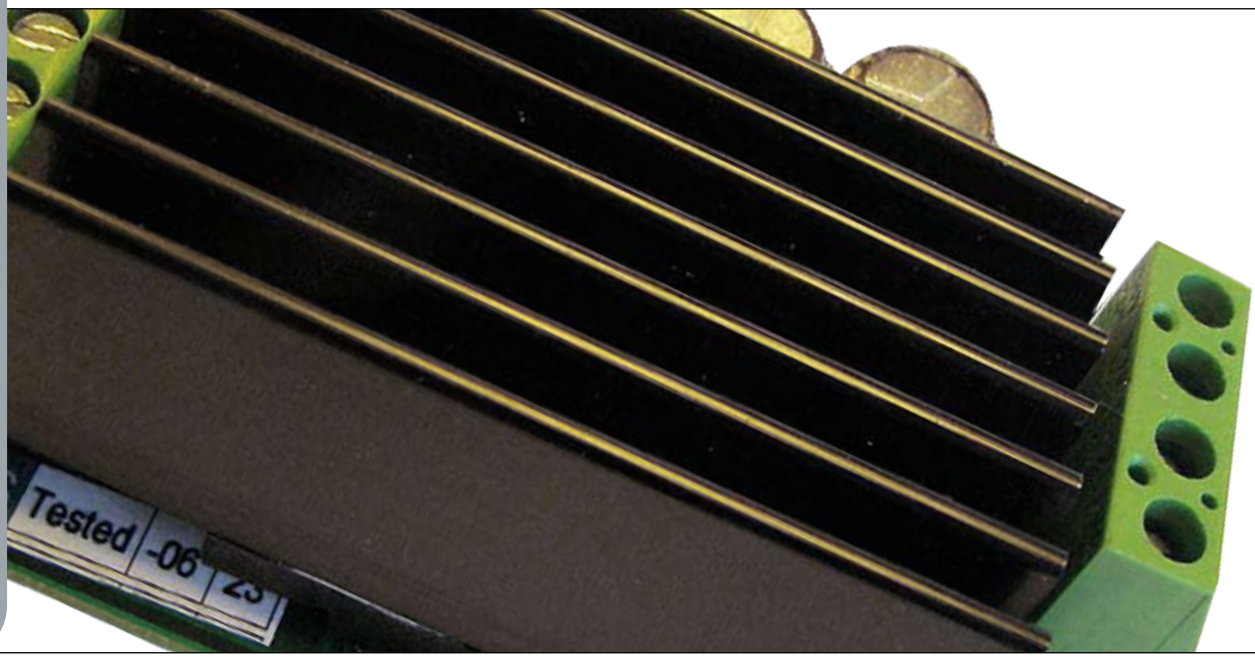
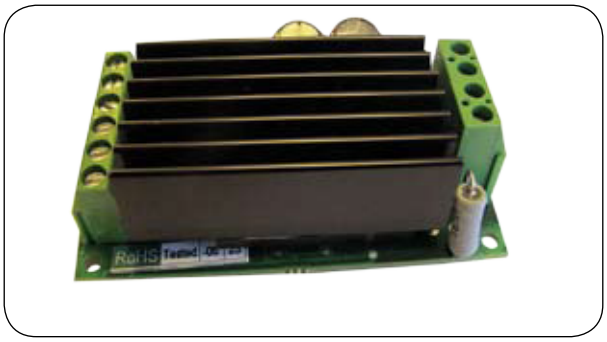
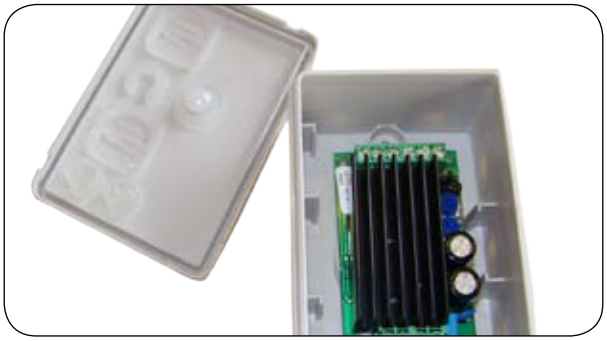


User Manual
C2-15





User Manual
C2-15

INTRODUCTION

C2-15 is developed for controlled ON-OFF driving and direction change of a DC-motor with brushes. Driver has advanced current limit features. It limits the motor current in start-up and jam-situations and that way protects the motor and mechanics from over torque. Driver has also an error output to indicate error / over current situations.

The acceleration ramp time for start up is adjustable to suit each application. In other words the motor voltage is slowly rised to give a smooth start-up. As the control is set off, the motor is dynamically braked with so called short-circuit braking. The motor poles are connected together. The reverse and forward commands can be set with positive and negative control. The freewheel command sets motor run free. Freewheel overrides forward and backwards commands.
The current protection is double acting. First there is a continous and adjustable current limit which decreases the motor voltage if the current exceeds the adjusted value. Secondly, there is settable trip feature that cuts the motor voltage if the current limit value is exceeded (after trip delay 2 ms). After trip the motor starts only to the opposite direction. Additionally the driver doubles the adjusted current value for 0.3 seconds in start-up to ensure sufficient power to overcome the start-up friction. Error output indicates the activation of the current limit.

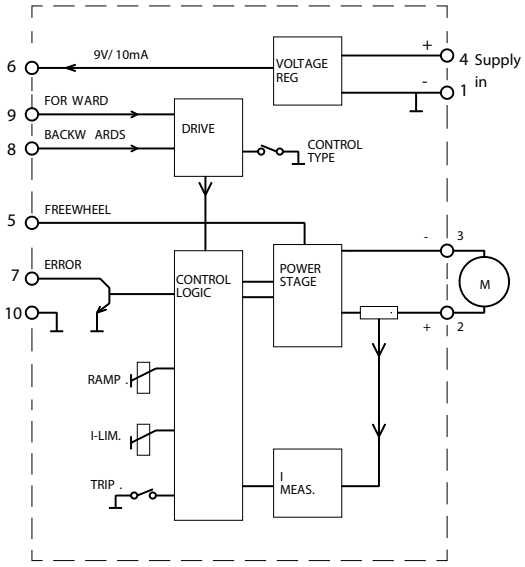
FEATURES

- Fast change of direction
- Soft start-up, acceleration ramp
- Settable current limit
- Trip or continuous current limit
- High efficiency
- Dynamic braking
- High momentary load capacity
- Rail base fittable
- Freewheel option
- Two control modes

TECHNICAL DATA

Supply	12-32 Vdc
Over voltage protection	40 V
Idle current	Approx. 30 mA
Driving current	10A continuous
	15A 50/50%
Current limit	1 ... 15A
	2 ... 30A in start-up
Current trip delay	n. 2 ms
Start delay	5 ms
Stop delay	5 ms
Direction change time	n. 20 ms
Voltage loss	0.5 V (Im = 15A)
Operating frequency	500 Hz
Ramp	0.10, 20, 40, 80, 150 ms
	0.25, 0.5, 1 s
Digital inputs	"off" @ U_{in} 4-30 V or open
	"on" @ U_{in} 0-1 V
Error output	Max. 30 V 50 mA
Operating temp. (Ta)	-20 ... +70 °C
Measures:	
C2-04DIN (DIN version)	90 x 46 x 51 mm (L x W x H)
C2-04BOX (box version)	100 x 72 x 46 mm (L x W x H)
Weight	Approx. 80 g

C2-04 Block Diagram



Supply should be filtered 12-32 Vdc,
maximum ripple <30% on full load.

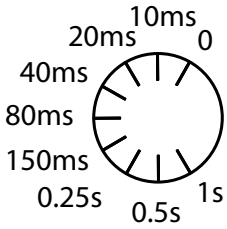
> Attention!
> Wrong supply polarity can damage the driver.
>
> Attention!
> Driver has no fuse in it.

Choose the current limit mode:
continuous / tripping

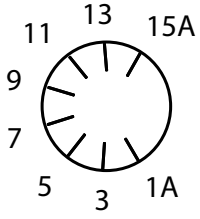
Trip jumper:
On = tripping limit
Off = continuous limit

Choose control mode
(forward / backwards)
pos = PNP positive control
neg = NPN negative control

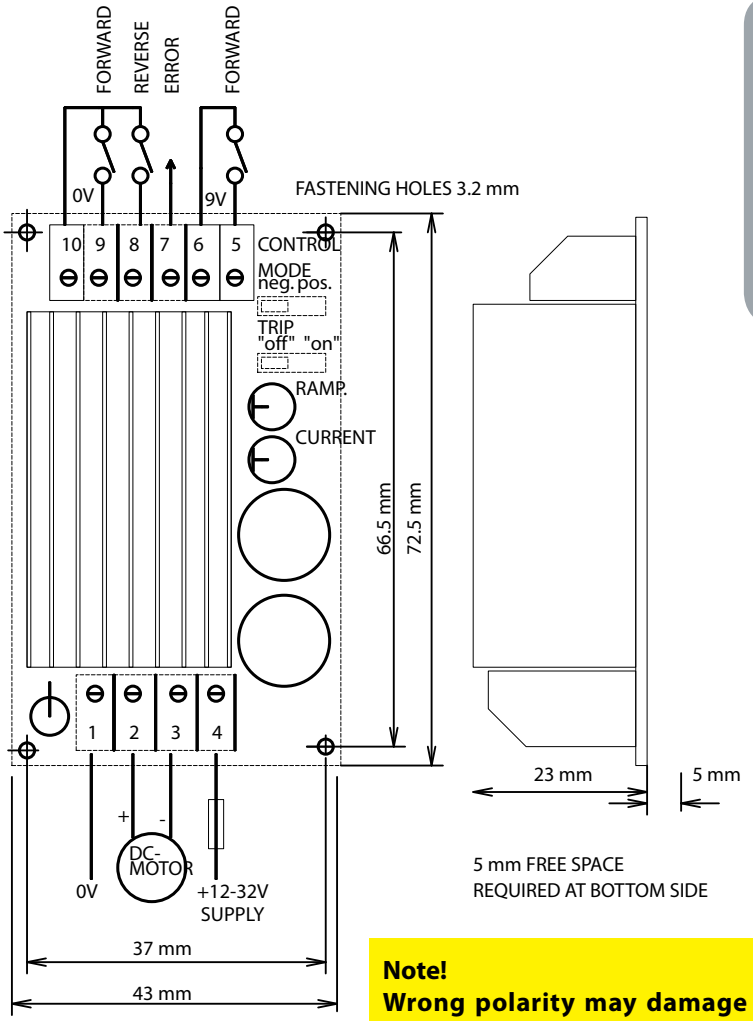
Choose the ramp time



Choose the current limit value / Amps.

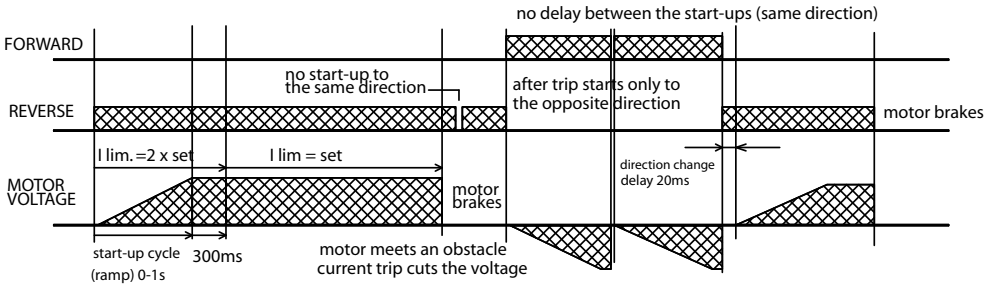


> Attention!
> The current limit values can be affected by the used motor.
>
> In start-up the current limit value is doubled (for 0.3 seconds).

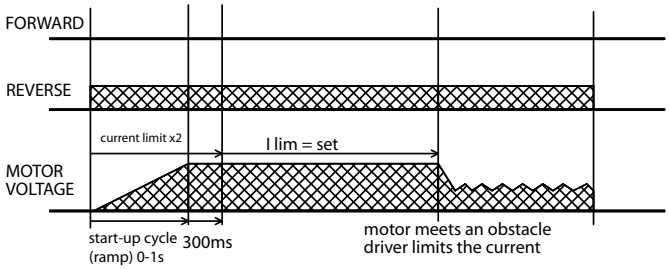


Note!
Wrong polarity may damage the device.
Use external fuse according to use (1 - 16 A).

OPERATIONAL EXAMPLE: tripping current limit


no delay between the start-ups (same direction)
FORWARD
REVERSE
no start-up to the same direction
after trip starts only to the opposite direction
motor brakes
I lim. =2 x set
I lim = set
direction change delay 20ms
MOTOR VOLTAGE
motor brakes
start-up cycle (ramp) 0-1s
300ms
motor meets an obstacle current trip cuts the voltage

OPERATION EXAMPLE: continuous current limit



Error signal: (7)
When C2-15 goes into "overcurrent" mode, then 7 is pulled low.
(Open collector type max. 50 mA). When using together with controller (e.g. PLC) without internal pull-up resistor, then install external pull-up on 10 kΩ. When working on 24 V in PLC, the current will be 2.4 mA in "overcurrent" mode.

Control mode (switch):
When put in mode "neg" is when a negativ (ground)signal is put on pin 8 and 9 to run motor "backward" and "forward".
When using "neg" mode, then pin 10 can be used as the negative supply.
When put in mode "pos" is when a positive (+)signal is put on pin 8 and 9 to run motor "backward" and "forward".
When using "pos" mode, then pin 6 can be used as the positive supply.
Current for pin 8+9 is <1 mA when active.

Functions:

"Error" = 24 V => circuit not in "overcurrent" mode.
"Error" = 0 V => circuit in "overcurrent" mode.

If C2-15 goes into "overcurrent" mode, it is only possible to start motor in opposite direction.

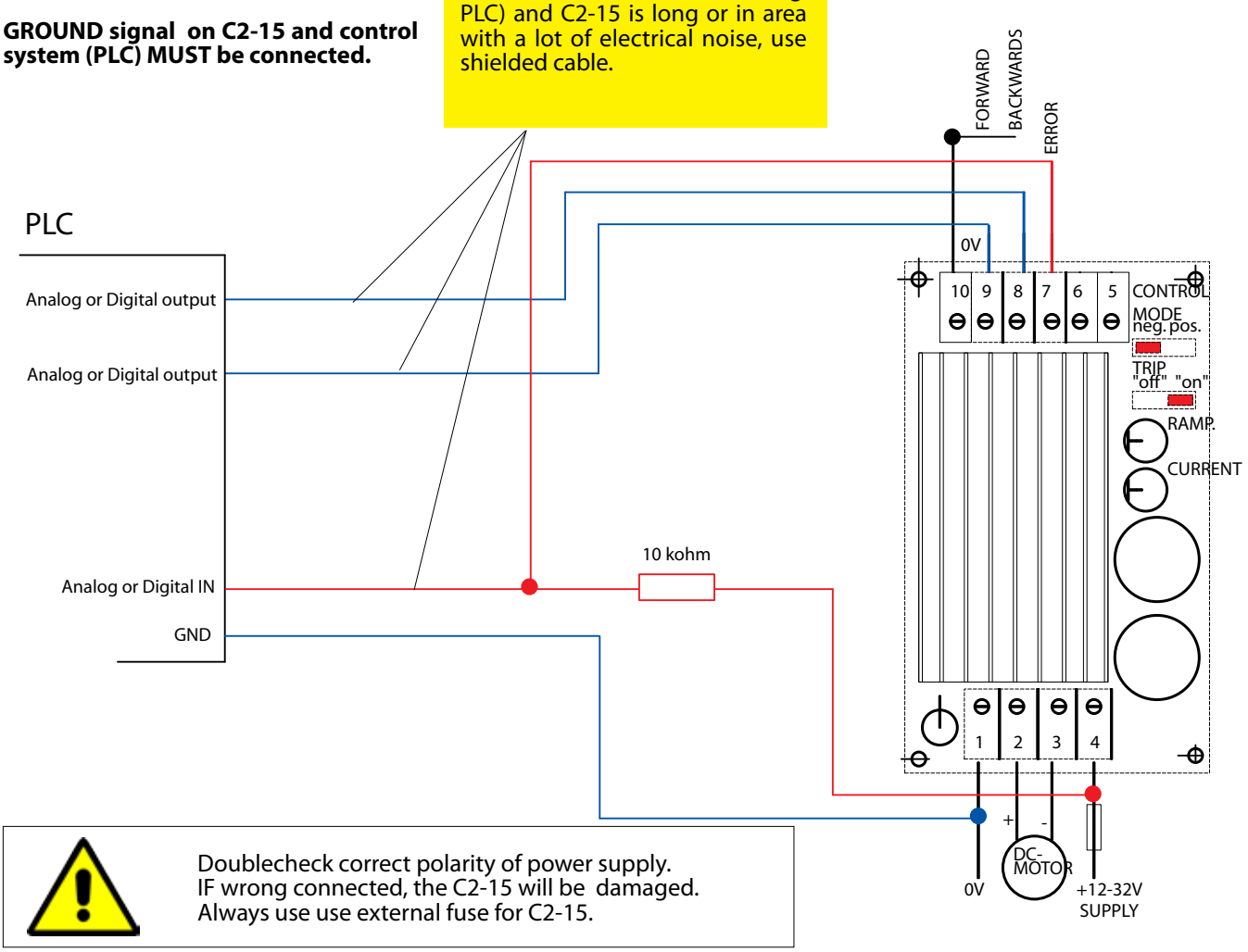
Note:

RAMP
It is HIGHLY recommended to use "RAMP". Adjust to more than 0.3 seconds, which secures best conditions for long motor lifetime!

CURRENT
Please adjust the currentlimit to be 10% higher than maximum current during running the actuator. This gives best conditions for long motor and actuator mechanical lifetime.

GROUND signal on C2-15 and control system (PLC) MUST be connected.

Note:
If distance between controller (e.g. PLC) and C2-15 is long or in area with a lot of electrical noise, use shielded cable.



Doublecheck correct polarity of power supply.
IF wrong connected, the C2-15 will be damaged.
Always use use external fuse for C2-15.

Specifications subject to change without prior notice. It is the responsibility of the product user to determine the suitability of concens as products for a specific application.

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